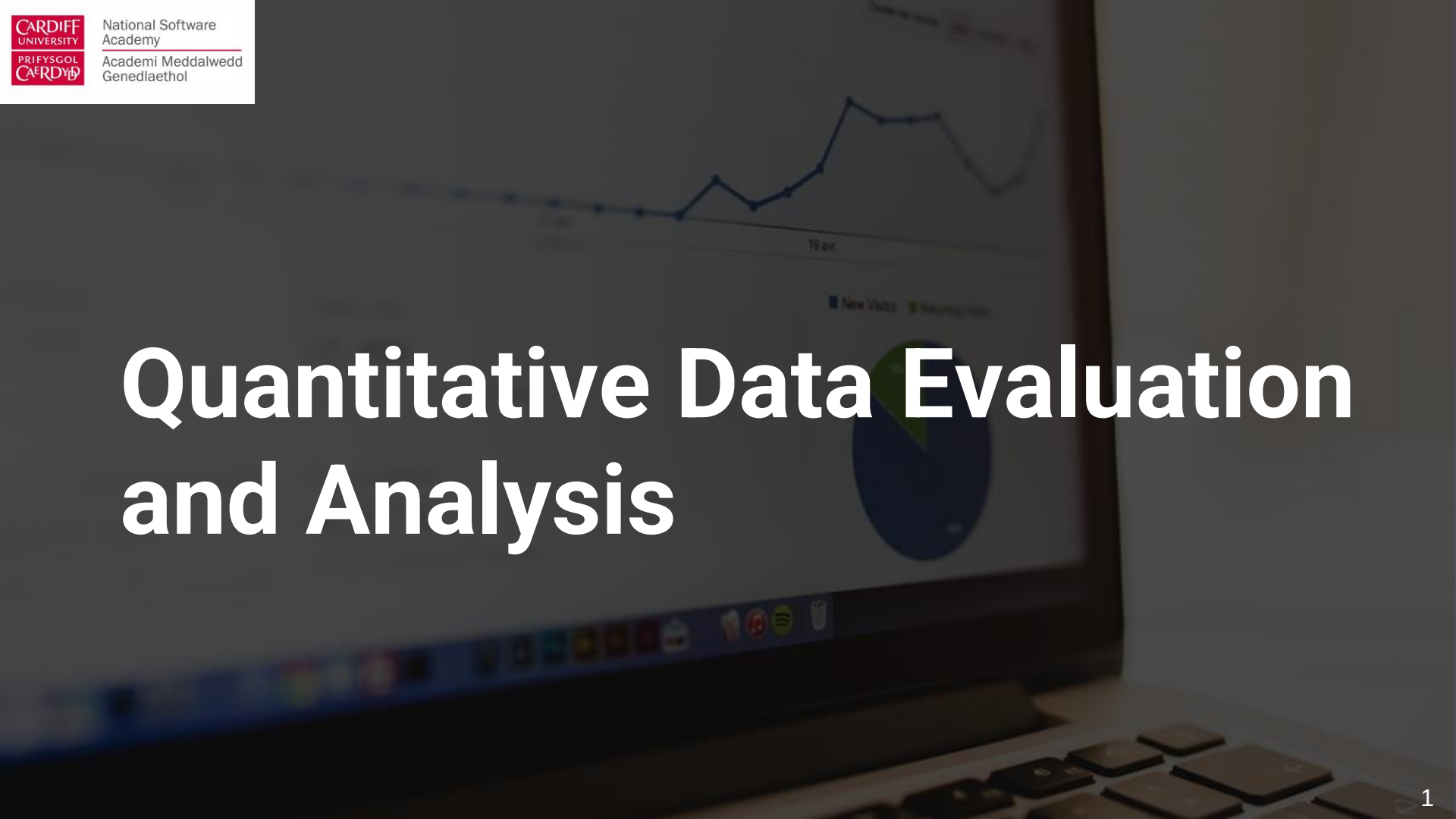


Quantitative Data Evaluation and Analysis

We have the data… now what?

Remember our lesson on data gathering, using techniques such as user research (questionnaires, interviews etc)

Let’s dive in... Quantitative Data

Can be quantified.

Numbers

Participant	Age
1	22
2	32
3	42
4	21
5	18

Can be Numbers

Participant	Loved it	Hated it
1	✓	
2		✓
3	✓	
4	✓	
5		✓
Total:	3	2

How to analyse them…

Mean

Most typical value

Sum of values divided by the number of values

Age
22
22
42
31
18

Average age:
(22+22+42+31+18) / 5

= 27

Median

Middle number of a sorted list

Age
22
22
42
31
18

Median:
18, 22, 22, 31, 42

= 22

Mode

Most occurring number

Age
22
22
42
31
18

Median:
18, 22, 22, 31, 42

= 22

Questions…

1) What happens if we want to calculate the median of an even number… of numbers?

2) Bring out examples of when we would need to use each one of the three.

How to analyse them…

Total

Dept	Budget
1	300
2	200
3	400
4	300
5	200

Total : 1400

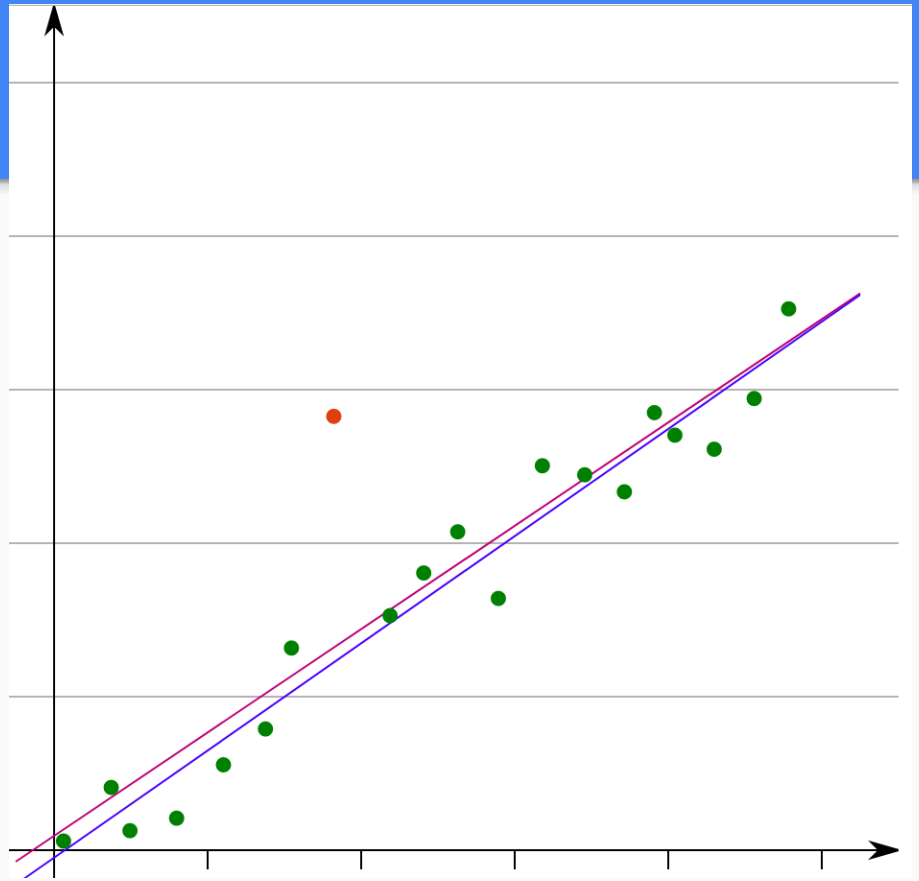
Percentage

Dept	Budget	%
1	300	21.42857
2	200	14.28571
3	400	28.57143
4	300	21.42857
5	200	14.28571

Outliers

Why does an outlier exist?

- Accidental Reading?
- Wrong Participant?
- Interesting Case?



Comparing Variables

How can you tell if two sets of statistics are related, and by how much?

100m Set Trainers	100m with new trainers
14.6	11.34
15.4	12.45
16.7	15.5
18.9	15.2
13.4	12.8
15.7	13.1
17.2	15.9
18.5	16.4
14.3	12.2

National Software Academy
Academi Meddalwedd Genedlaethol

Comparing Variables

How can you tell if two sets of statistics are related, and by how much?

Trainers = Better

100m set trainers	100m with new trainers
14.6	11.34
15.4	12.45
16.7	15.5
18.9	15.2
13.4	12.8
15.7	13.1
17.2	15.9
18.5	16.4
14.3	12.2

Total:	144.7	124.89
Average :	16.07777778	13.87666667

Comparing Variables

How can you tell if two sets of statistics are related, and by how much?

Trainers ≠ Better

	100m set trainers	100m with new trainers
	14.6	14.4
	15.4	15.2
	16.7	17.5
	18.9	17.9
	13.4	13.1
	15.7	15
	17.2	16.7
	18.5	18.1
	14.3	14.1
Total:	144.7	142
Average:	16.07777778	15.77777778

Comparing Variables

Using these tests you find statistical significance if the value is under 5% or 1% depending on the test ($p < 0.05$).

Comparison of means	Parametric (means)	Non-parametric (medians)
Differences between the means of two independent groups	Independent t-test	Mann-Whitney test
Differences between paired (matched) samples e.g. weight before and after a diet for each subject	Paired t-test	Wilcoxon signed rank test
Differences in the means of 3+ independent groups for one variable	One-way ANOVA	Kruskal-Wallis test
Differences between 3+ measurements on the same subject	Repeated Measures ANOVA	Friedman test
Relationships between variables	Parametric	Non-parametric
Strength of a relationship between 2 continuous variables	Pearson's Correlation Co-efficient	Spearman's Correlation co-efficient
Predicting the value of one variable given the value of a predictor variable	Simple Linear Regression	
Assessing the relationship between two categorical variables.		Chi-squared test

Recommended Reading

Rowntree, Derek. Statistics without tears: A primer for non-mathematicians. Scribner Book Company, 1981.